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AUTHOR Cicchelli, Terry; And Others
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ABSTRACT

This paper reports the findings of a two-year computer literacy inservice project for high school teachers in various departments. A description is given of strategies used in designing and developing an inservice education program within a particular social system that had its own norms and expectations about learning technology. Theorizing that fear of change and failure are frequently factors in computer education, the program developers were guided in planning by considerations of the teachers' environment as well as the personal dimensions being experienced by individual teachers, including cognitive, behavioral, and affective dimensions. The Stages of Concern Questionnaire was used to collect data on teacher concerns over the two-year period. This instrument was used to assess teacher needs before and after the inservice project. An adapted version of the Levels of Use focused interview helped to identify what users and non-users were doing with microcomputers. Complementing these instruments, numerous conferences with school administrators assured a supportive environment for the learners. This included released time, use of consultants, available equipment and software, and intensive "hands-on" intervention. A description is given of how the learning project was organized, and the progress of the learners is depicted graphically. Conclusions and recommendations are offered. (JD)

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"Turning Teachers On To Microcomputers:
Results Of A Two-Year Staff Development Project"

Terry Cicchelli, Fordham University

Richard E. Baecher, Fordham University

Jan Nygren, Computer Basics, Inc.

Paper presented at National Council of States on Inservice Education

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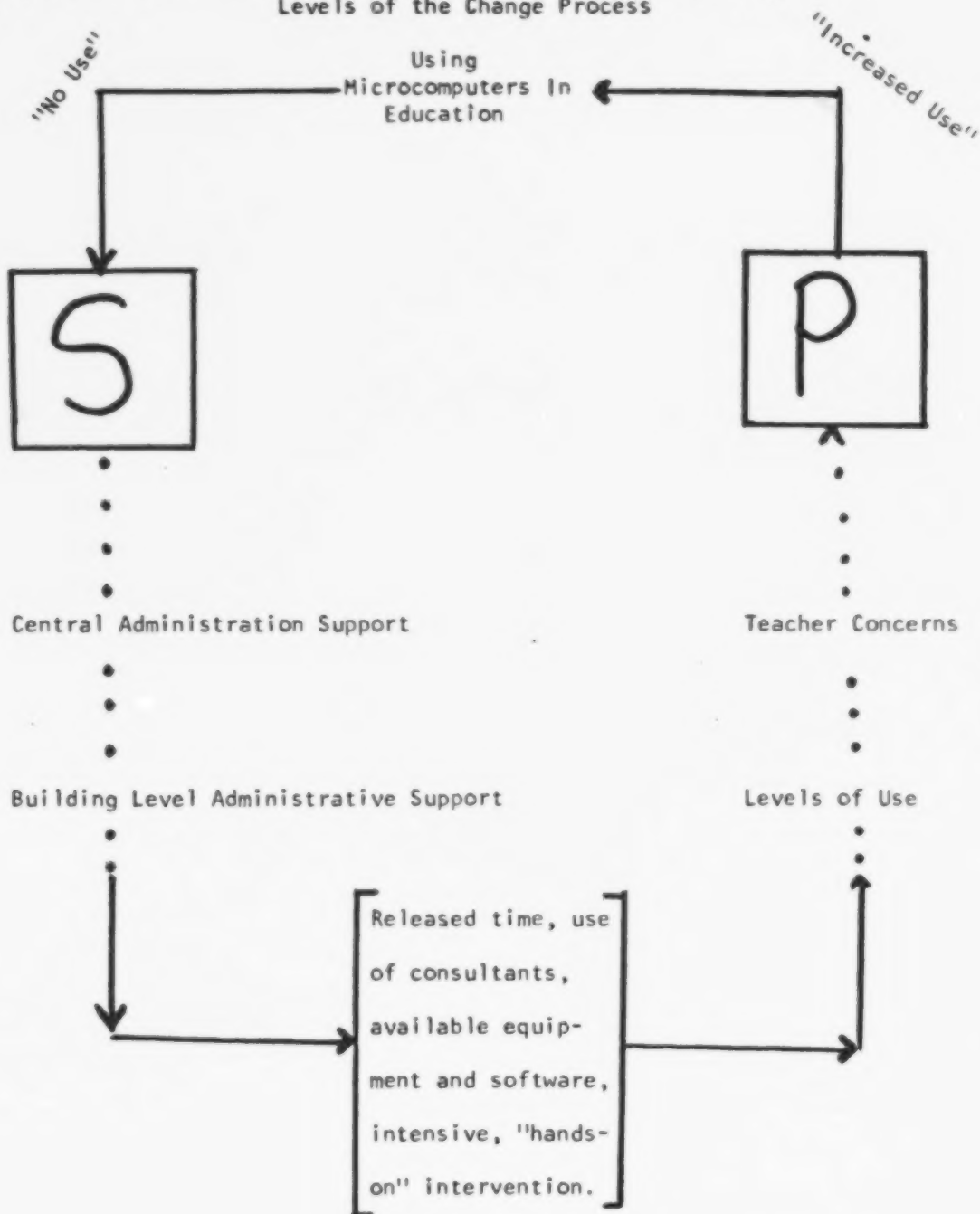
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Our paper will describe the critical steps we took to decrease teacher concerns about microcomputers and to increase their use. Mathieson (1982, p. 14) captures an inevitable feature of the nature of the problem we investigated in our two-year field research study:

Putting computers into classrooms represents an enormous risk to teachers and makes incredible demands on educators and our capacity for change and our understanding of a teacher's role.... Change generates fear: fear of displacement and domination, of knowing less than the student, of loss of decision-making power, of loss of control over the learning experience, of equipment failure, paperwork, and the breaking of the machine.

We reasoned that unless these diverse concerns of teachers were systematically heeded in our staff development project, the computer would remain an unpredictable foe in the learning process. Emrick et al.'s (1977) conclusion about change occurring simultaneously in two dimensions guided our planning: a systemic one involving change in the user environment, and a personal dimension, being experienced by individual teachers, including cognitive, behavioral, and affective elements. The connections between the personal (P) and systemic (S) levels of the change process, are presented in our paper. Figure 1 conveys the dynamic and complex connections that we sought to uncover in our two-year field-based investigation.

Figure 1. Connections between Systemic (S) and Personal (P) Levels of the Change Process



We interpreted S to mean the leadership and support provided by central and school building administration; P represents the targeted areas of change, such as, teacher concerns and the extent of previous and current use of microcomputers. The arrows focus attention on some specific connections that were important to us. Those parts of the figure labelled "No Use" and "Increased Use" indicate the initial problem state and outcome, respectively, of this high school situation. Lastly, the items listed within the brackets stand for some of the critical processes that together transformed or "turned on" teachers to microcomputers.

Objective of Paper:

The intent of our paper is threefold: (1) to report the findings of our two-year computer literacy inservice project for high school teachers in various departments; (2) to describe our strategies in designing and developing an inservice education program within a particular social system that had its own norms and expectations about learning technology; and (3) to identify some critical ingredients in successfully implementing staff development projects of this nature. Data in qualitative and quantitative forms were gathered from various sources to help us design and accomplish what we term "data-based inservice for change," i.e., adhering to the systemic and personal dimensions of change through focused, empirical exploration.

Theoretical Perspectives:

We operationalized this objective by using Hall et al.'s Stages of Concern framework (1979) and suggestive aspects of Howey and Vaughan's principles of effective staff development (1983). According to Hall et al.

(1979) change must be viewed as a process that occurs at the individual level. Related to any innovation are individual concerns that teachers experience across time. Seven distinct stages of concern have been identified: awareness, informational, personal, management, consequences, collaboration, and refocusing. The first three are self concerns, the next one refers to task, and the last three cover impact. Hall et al. claim these stages are developmental. See the appendix that lists these stages in more detail.

Two features of Howey and Vaughan's classification scheme on staff development received support from our investigation. "Interactiveness" was confirmed in the significant changes noted in teachers' expressed concerns for greater collaboration; and "documentation" was an important variable of our entire study, i.e., collecting and reporting our results of changed teacher concerns and behaviors to various administrators and teachers.

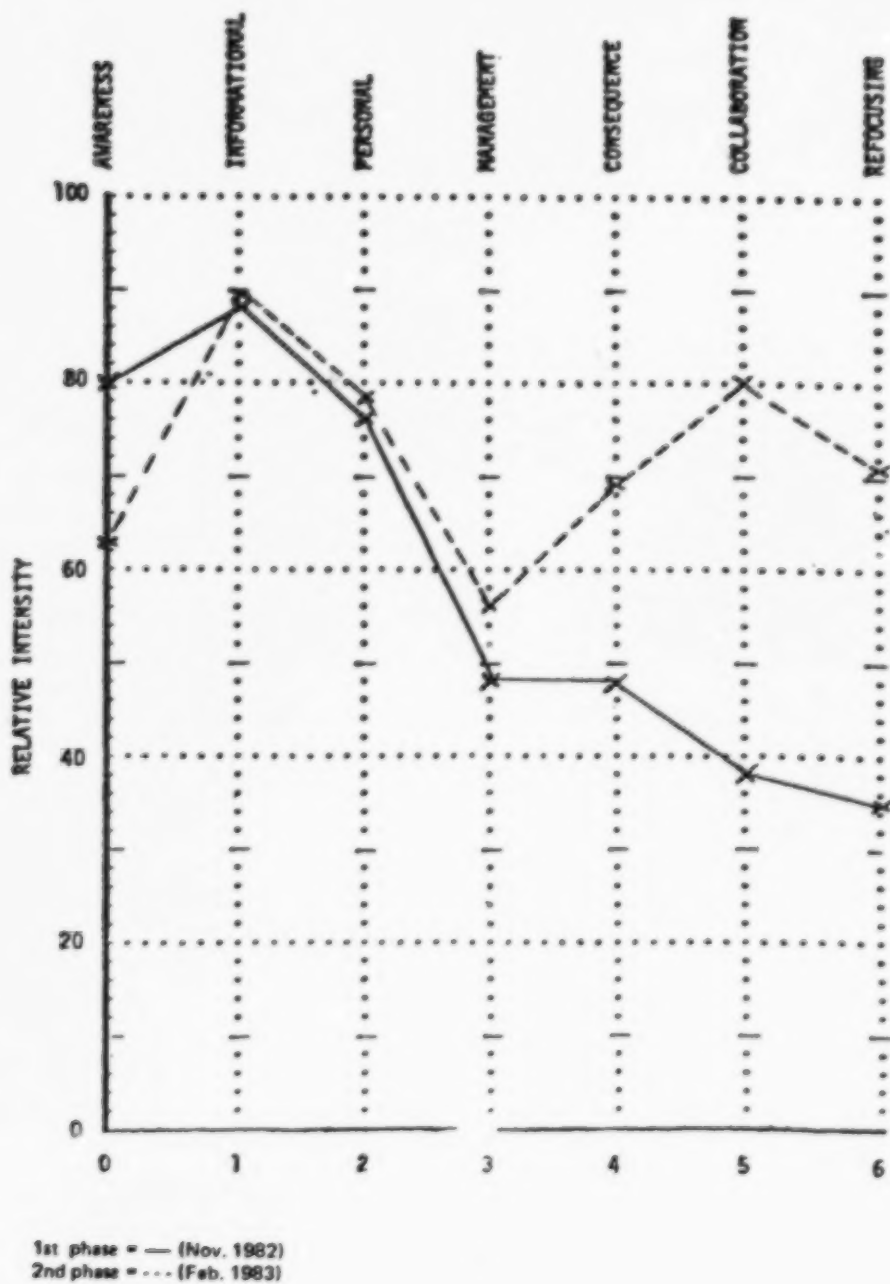
Methodology and Findings:

The Stages of Concern Questionnaire (SoCQ) (1979), a 35-item Likert type scale, was used to collect data on teacher concerns over a two-year period. This vehicle enabled us to assess teacher needs before and after our inservice project. An adapted version of the Levels of Use (LoU) focused interview helped us to identify what users and non-users were doing with microcomputers. Complementing these instruments, numerous conferences over a two year period with central district office staff and the high school principal, along with first hand observations of the high school's social system, were an integral source for our data collection.

The procedures we followed included: (1) the principal selected two separate groups of 24 each from the teachers who completed the SoCQ; (2) a computer advocate with teaching experience provided specific content in computer applications (e.g., computer awareness, word-processing, etc.); (3) the entire computer literacy project was done with a "hands-on" approach in the high school computer labs; (4) participants were released from their teaching duties during the day to receive 9-12 hours of intensive inservice; and (5) final reports were submitted to the high school principal at the end of each phase, which included data on teacher concerns and their summative evaluation of the intervention.

First year results revealed significant changes in teacher concerns about microcomputers; specifically, self concerns were reduced and impact concerns were increased. One explanation for these findings is the developmental nature of the stages of concern that characterized this group of non-users. Figure 2 graphically portrays the movement of this change.

Figure 2 Percentile Scores of 18 Teachers' Concerns about Computer Technology as Measured by SoCQ (Nov., 1982 and Feb. 1983)



Second year results identified another interesting pattern of what we call "operant concerns" for a second group of teachers (mostly English and Social Studies), (Stephenson, 1978), i.e., pivotal concerns at the end of the computer literacy project. Using the same stages of concern but measuring them by Q-sort methodology, personal and collaboration concerns were the strongest factors that emerged, leading us to conclude the uncertainty and uneasiness teachers continued to feel about microcomputers. Although a developmental movement is not obvious, these teachers were expressing a "felt" need for more help in integrating micros into their classrooms.

Other results of our investigation demonstrated the "interactiveness" between the personal and systemic dimensions of change. Administrator support through released time and on-site training was evident over the two year period. Some obstacles that were partially overcome included computer training by sensitive and knowledgeable staff developers instead of the math department which controlled the computer labs in the school and the diffusion of computer information to subject areas in a systematic fashion rather than the haphazard approach followed in the past.

Conclusions:

Among the many conclusions of our two year field study, these few stand out:

1. Teacher concerns must be used in any staff development effort and must be viewed as partially developmental and operant;
2. Staff development projects that aim to increase teacher use of micros are complex and demand attention to personal and systemic levels of change; and
3. Hands-on experience with micros, delivered by sensitive and

competent trainers, is essential to the success of any staff development program of this nature.

We believe our initial, exploratory venture into the emerging culture of microcomputers has yielded some suggestive findings that require a "data-based inservice for change" approach.

References

- Hall, G.; George, A.; Rutherford, W. (1979). Measuring stages of concern about the innovation: A manual for use of the SoC questionnaire. University of Texas, Austin.
- Howey, K; & Vaughn, J. (1983). Current patterns of staff development. In S. Griffin (ed.), Staff development. Eighty-second Yearbook of the National Society for the Study of Education. Chicago: University of Chicago Press.
- Mathieson, D. (Nov. 1982). Computers: From confusion to collaboration. Educational Leadership, 13-15.
- Stephenson, W. (1978). Concourse theory of communication. Communication, Vol. 3,: 21-40.

STAGES OF CONCERN ABOUT THE INNOVATION*

Impact	[	6	REFOCUSING: The focus is on exploration of more universal benefits from the innovation, including the possibility of major changes or replacement with a more powerful alternative. Individual has definite ideas about alternatives to the proposed or existing form of the innovation.
		5	COLLABORATION: The focus is on coordination and cooperation with others regarding use of the innovation.
		4	CONSEQUENCE: Attention focuses on impact of the innovation on student in his/her immediate sphere of influence. The focus is on relevance of the innovation for students, evaluation of student outcomes, including performance and comprehension, and changes needed to increase student outcomes.
Task		3	MANAGEMENT: Attention is focused on the processes and tasks of using the innovation and the best use of information and resources. Issues related to efficiency, organizing, managing, scheduling, and time demands are utmost.
Self	[	2	PERSONAL: Individual is uncertain about the demands of the innovation, his/her inadequacy to meet those demands, and his/her role with the innovation. This includes analysis of his/her role in relation to the reward structure of the organization, decision making, and consideration of potential conflicts with existing structures or personal commitments. Financial or status implications of the program for self and colleagues may also be reflected.
		1	INFORMATIONAL: A general awareness of the innovation and interest in learning more detail about it is indicated. The person seems to be unworried about himself/herself in relation to the innovation. She/he is interested in substantive aspects of the innovation in a selfless manner such as general characteristics, effects, and requirements for use.
Unrelated		0	AWARENESS: Little concern about or involvement with the innovation is indicated.

*Original concept from G.E. Hall, R.C. Wallace, Jr., & W.A. Dowett, *A Developmental Conceptualization of the Adoption Process within Educational Institutions* (Austin, Tex.: Research and Development Center for Teacher Education, The University of Texas, 1973).

Turning Teachers On To Microcomputers: Results Of A Two-Year Staff
Development Project

Presenters:

Terry Cicchelli, Assistant Professor

Richard E. Baecher, Associate Professor

School of Education
Fordham University at Lincoln Center
New York, N. Y. 10023

Jan Nygren, President

Computer Basics, Inc.
110 School Street
Glen Cove, N. Y. 11542

"This instrument can teach, it can illuminate; yes, it can even inspire;
But it can do so only to the extent that humans are determined to use it
to those ends. Otherwise it is merely lights and wires in a box."
Edward R. Murrow.

Paper presented at National Council of States on Inservice Education
(NCSIE), Orlando, Florida, 11-17-84.

Turning Teachers On To Microcomputers: Results Of A Two-Year Staff Development Project

The introduction of microcomputers into the schools can be a threatening experience for teachers. Unless teacher concerns at the personal level are viewed in connection with support at the systemic level, microcomputers will become the next scapegoat for educational stagnation. Our paper intends to: (1) report some of our findings of a two-year computer literacy inservice project for high school teachers in various departments; (2) describe our strategies in designing and delivering an inservice education program; and (3) articulate some critical ingredients in successfully implementing projects of this nature. Our findings partially confirmed Hall's Stages of Concern and Howey and Vaughan's principles of "interactiveness" and documentation.

OUTLINE

- I. Specific Need for a Study of This Nature—Terry Clochelli
- II. Change at Two Levels: S + P —Richard E. Baecher
- III. Content of Computer Focused Intervention—Jan Nygren
- IV. Findings: Some Positive, Some Question Raising—Baecher
- V. What Really Matters In Staff Development:—Clochelli
- VI. Questions/Comments from Audience...

"TURNING TEACHERS ON TO MICROCOMPUTERS: RESULTS OF A TWO-YEAR STAFF DEVELOPMENT PROJECT"



Presenters:

COMPUTER BASICS INC.
110 School Street
Glen Cove, NY 11542
(516) 671-3615

Terry Cicchelli, Richard Baecher, Jan Nygren

CONTENTS OF INTENSIVE HANDS-ON COMPUTER FOCUSED INTERVENTION

Three areas were developed to bring about change at the individual level:

Teacher Security: Introduction - History - Literacy
Hardware - Software - Programming - Assignments
User Groups - Sharing - Communicating

Teacher Support: Individual One-To-One Instruction
Hands-On - Humanizing
Immediate Response - Direction

Teacher Success: Integrated Use
Individual Enthusiasm
Positive Expectations
Further Personal Involvement

***** SAMPLE INSERVICE WORKSHOP AGENDA: *****

DAY I			Day III		
9:00 AM — 12:00 Noon	Group B	Resource Room	9:00 AM — 12:00 Noon	Group B	Resource Room
	"Computers Are Fun!"			"Software For The Classroom"	
9:00 — 10:00	Characteristics and history, BASIC Language, memory, storage significance and impact. Apple IIe demonstration		9:00 — 10:00	Criteria for good educational software Demonstration, Apple IIe	
10:00 — 10:15	Discussion break		10:00 — 10:15	Discussion break	
10:15 — 11:00	SFS Sources and resources		10:15 — 10:45	Interaction with software model	
			10:45 — 11:45	Hands-on activities in Computer Lab Teacher interaction with software on TRS-80 III and Apple II.	
11:00 — 12:00	Hands-on activities in Computer Lab TRS-80 III - Write a BASIC program		11:45 — 12:00	Resource Room: Evaluation, certification	

Paper Presented At National Council Of States On Inservice Education Conference
(NCSIE) Orlando, Florida, November 17, 1984

COMPUTER BASICS INC., OFFERS TEACHER TRAINING, STAFF DEVELOPMENT, WORKSHOPS AND SEMINARS
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